
Tucholsky
Wagner
Zola
Scott
Sydow
Schlegel
Turgenev
Wallace
Fonatne
Freud
Twain
Walther von der Vogelweide
Fouqué
Friedrich II. von Preußen
Weber
Freiligrath
Frey
Fechner
Fichte
Weiße Rose
von Fallersleben
Kant
Ernst
Frommel
Richthofen
Hölderlin
Engels
Fielding
Eichendorff
Tacitus
Dumas
Fehrs
Faber
Flaubert
Eliasberg
Ebner Eschenbach
Maximilian I. von Habsburg
Feuerbach
Fock
Zweig
Eliot
Vergil
Ewald
Goethe
London
Elisabeth von Österreich
Mendelssohn
Balzac
Shakespeare
Dostojewski
Ganghofer
Lichtenberg
Rathenau
Trackl
Stevenson
Doyle
Gjellerup
Hambruch
Tolstoi
Mommsen
Lenz
Droste-Hülshoff
Thoma
Hanrieder
Dach
Verne
von Arnim
Hägele
Hauff
Humboldt
Reuter
Karrillon
Rousseau
Hagen
Hauptmann
Gautier
Garschin
Damaschke
Defoe
Hebbel
Baudelaire
Descartes
Hegel
Kussmaul
Herder
Wolfram von Eschenbach
Schopenhauer
Darwin
Dickens
Rilke
George
Bronner
Melville
Grimm
Jerome
Bebel
Campe
Horváth
Aristoteles
Proust
Voltaire
Federer
Bismarck
Vigny
Barlach
Herodot
Gengenbach
Heine
Storm
Casanova
Tersteegen
Grillparzer
Georgy
Gilm
Chamberlain
Lessing
Langbein
Gryphius
Brentano
Lafontaine
Strachwitz
Claudius
Schiller
Kralik
Iffland
Sokrates
Bellamy
Schilling
Katharina II. von Rußland
Gerstäcker
Raabe
Gibbon
Tschechow
Löns
Hesse
Hoffmann
Gogol
Wilde
Vulpius
Gleim
Luther
Heym
Hofmannsthal
Morgenstern
Klee
Hölty
Goedicke
Roth
Heyse
Klopstock
Kleist
Luxemburg
Puschkin
Homer
Mörike
La Roche
Horaz
Musil
Machiavelli
Kierkegaard
Kraft
Kraus
Navarra
Aurel
Musset
Lamprecht
Kind
Kirchhoff
Hugo
Moltke
Nestroy
Marie de France
Laotse
Ipsen
Liebknecht
Nietzsche
Nansen
Ringelnatz
Marx
Lassalle
Gorki
Klett
Leibniz
von Ossietzky
May
vom Stein
Lawrence
Irving
Petalozzi
Knigge
Platon
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# Handbook on Japanning: 2nd Edition For Ironware, Tinware, Wood, Etc. With Sections on Tinplating and Galvanizing

William N. Brown

## Imprint

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# HANDBOOK ON JAPANNING.

## SECTION I.

## INTRODUCTION.

Japanning, as it is generally understood in Great Britain, is the art of covering paper, wood, or metal with a more or less thick coating of brilliant varnish, and hardening the same by baking it in an oven at a suitable heat. It originated in Japan—hence its name—where the natives use a natural varnish or lacquer which flows from a certain kind of tree, and which on its issuing from the plant is of a creamy tint, but becomes black on exposure to the air. It is mainly with the application of "japan" to metallic surfaces that we are concerned in these pages. Japanning may be said to occupy a position midway between painting and porcelain enamelling, and a japanned surface differs from an ordinary painted surface in being far more brilliant, smoother, harder, and more durable, and also in retaining its gloss permanently, in not being easily injured by hot water or by being placed near a fire; while real good japanning is characterised by great lustre and adhesiveness to the metal to which it has been applied, and its non-liability to chipping—a fault which, as a rule, stamps the common article.

If the English process of japanning be more simple and produces a less durable, a less costly coating than the Japanese method, yet its practice is not so injurious to the health. Indeed, it is a moot point in how far the Japanese themselves now utilize their classical process, as the coat of natural japan on all the articles exhibited at the recent Vienna exhibition as being coated with the natural lacquer, when recovered after six months' immersion in sea water through the sinking of the ship, was destroyed, although it stood perfectly well on the articles of some age. In the English method, where necessary, a priming or undercoat is employed. It is customary to fill up any uneven surface, any minute holes or pores, and to render the surface to be japanned uniformly smooth. But such an undercoat or priming is not always applied, the coloured varnish or a proper japan ground being applied directly on the surface to be japanned. Formerly this surface usually, if not always, received a priming

coat, and it does so still where the surface is coarse, uneven, rough, and porous. But where the surface is impervious and smooth, as in the case of metallic surfaces, a priming coat is not applied. It is also unnecessary to apply such a coat in the case of smooth, compact, grained wood. The reason for using this coating is that it effects a considerable saving in the quantity of varnish used, and because the matter of which the priming is composed renders the surface of the body to be varnished uniform, and fills up all pores, cracks, and other inequalities, and by its use it is easy after rubbing and water polishing to produce an even surface on which to apply the varnish. The previous application of this undercoat was thus an advantage in the case of coarse, uneven surfaces that it formed a first and sort of obligatory initial stage in the process of japanning. This initial coating is still applied in many instances. But it has its drawbacks, and these drawbacks are incidental to the nature of the priming coat which consists of size and whiting. The coats or layers of japan proper, that is of varnish and pigment applied over such a priming coat, will be continually liable to crack or peel off with any violent shock, and will not last nearly so long as articles japanned with the same materials and altogether in the same way but without the undercoat. This defect may be readily perceived by comparing goods that have been in use for some time in the japanning of which an undercoat has been applied with similar goods in which no such previous coat has been given. Provided a good japan varnish and appropriate pigments have been used and the japanning well executed, the coats of japan applied without a priming never peel or crack or are in any way damaged except by violence or shock, or that caused by continual ordinary wear and tear caused by such constant rubbing as will wear away the surface of the japan. But japan coats applied with a priming coat crack and fly off in flakes at the slightest concussion, at any knock or fall, more especially at the edges. Those Birmingham manufacturers who were the first to practise japanning only on metals on which there was no need for a priming coat did not of course adopt such a practice. Moreover, they found it equally unnecessary in the case of papier-mâché and some other goods. Hence Birmingham japanned goods wear better than those goods which receive a priming previous to japanning.

## Priming or Preparing the Surface to be Japanned.

The usual priming, where one is applied, consists of Paris white (levigated whiting) made into a thin paste with size. The size should be of a consistency between the common double size and glue, and mixed with as much Paris white as will give it a good body so that it will hide the surface on which it is applied. But in particular work glovers' or parchment size instead of common size is used, and this is still further improved by the addition of one-third of isinglass, and if the coat be not applied too thickly it will be much less liable to peel or crack. The surface should be previously prepared for this priming by being well cleaned and by being brushed over with hot size diluted with two-thirds of water, that is provided the size be of the usual strength. The priming is then evenly and uniformly applied with a brush and left to dry. On a fairly even surface two coats of priming properly applied should suffice. But if it will not take a proper water polish, owing to the uneven surface not being effectually filled up, one or more additional coats must be applied. Previous to the last coat being applied, the surface should be smoothed by fine glass paper. When the last coat of priming is dry the water polish is applied. This is done by passing a fine wet rag or moistened sponge over the surface until the whole appears uniformly smooth and even. The priming is now complete and the surface ready to take the japan ground or the coloured varnish.

## The First Stage in the Japanning of Wood or of Leather Without a Priming.

[The leather is first securely stretched on a frame or board.] In this case, that is when no priming coat is previously applied, the best way to prepare the surface is to apply three coats of coarse varnish (1 lb. seed-lac, 1 lb rosin to 1 gallon methylated spirit, dissolve and filter). This varnish, like all others formed from methylated spirits, must be applied in a warm place and all dampness should be avoided, for either cold or moisture chills it and thus prevents it taking proper hold of the surface on which it is applied. When the work is prepared thus, or by the priming made of size and whiting already described, the japan proper is itself applied.

## SECTION II.

### JAPAN GROUNDS.

The japan ground properly so called consists of the varnish and pigment where the whole surface is to be of one simple colour, or of the varnish, with or without pigment, on which some painting or other form of decoration is afterwards to be applied. It is best to form this ground with the desired pigment incorporated with shellac varnish, except in the case of a white japan ground which requires special treatment, or when great brilliancy is a desideratum and other methods must be adopted. The shellac varnish for the japan ground is best prepared as follows: shellac $1^1/_4$ lb., methylated spirits 1 gallon. Dissolve in a well-corked vessel in a warm place and with frequent shaking. After two or three days the shellac will be dissolved. It is then recommended to filter the solution through a flannel bag, and when all that will come through freely has done so the varnish should be run into a proper sized vessel and kept carefully corked for use. The bag may then be squeezed with the hand till the remainder of the fluid varnish is forced through it, and this if fairly clear may be used for rough purposes or added to the next batch. Pigments of any nature whatever may be used with the shellac varnish to give the desired tint to the ground, and where necessary they may be mixed together to form any compound colour, such as blue and yellow to form green. The pigments used for japan grounds should all be previously ground very smooth in spirits of turpentine, so smooth that the paste does not grate between the two thumb nails, and then only are they mixed with the varnish. This mixture of pigment and varnish vehicle should then be spread over the surface to be japanned very carefully and very evenly with a camel-hair brush. As metals do not require a priming coat of size and whiting, the japan ground may be applied to metallic surfaces forthwith without any preliminary treatment except thorough cleansing, except in the cases specially referred to further on. On metallic surfaces three to four coats are applied, and in the interval between each coat the articles must be stoved in an oven heated to from 250° to 300° F.

## White Japan Grounds.

The formation of a perfectly white japan ground and of the first degree of hardness has always been difficult to attain in the art of japanning, as there are few or no substances that can be so dissolved as to form a very hard varnish coat without being so darkened in the process as to quite degrade or spoil the whiteness of the colour. The following process, however, is said to give a composition which yields a very near approach to a perfect white ground: Take flake white or white lead washed and ground up with the sixth of its weight of starch and then dried, temper it properly for spreading with mastic varnish made thus: Take 5 oz. of mastic in powder and put it into a proper vessel with 1 lb. of spirits of turpentine; let them boil at a gentle heat till the mastic be dissolved, and, if there appear to be any turbidity, strain off the solution through flannel. Apply this intimate and homogeneous mixture on the body to be japanned, the surface of which has been suitably prepared either with or without the priming, then varnish it over with five or six coats of the following varnish: Provide any quantity of the best seed-lac and pick out of it all the clearest and whitest grains, take of this seed-lac $^1/_2$ lb. and of gum anime $^3/_4$ lb., pulverize the mixture to a coarse powder and dissolve in a gallon of methylated spirits and strain off the clear varnish. The seed-lac will give a slight tint to this varnish, but it cannot be omitted where the japanned surface must be hard, though where a softer surface will serve the purpose the proportion of seed-lac may be diminished and a little turpentine oleo-resin added to the gum anime to take off the brittleness. A very good varnish entirely free from brittleness may, it is said, be formed by dissolving gum anime in old nut or poppy oil, which must be made to boil gently when the gum is put into it. After being diluted with turps the white ground may be applied in this varnish, and then a coat or two of the varnish itself may be applied over it. These coats, however, take a long time to dry, and, owing to its softer nature, this japanned surface is more readily injured than that yielded by the shellac varnish.

According to Mr. Dickson, "the old way of making a cream enamel for stoving (a white was supposed to be impossible) was to mix ordinary tub white lead with the polishing copal varnish and to add

a modicum of blue to neutralize the yellow tinge, stove same in about 170°F. and then polish as before described". "This," continues Mr. Dickson, "would at the best produce but a very pale blue enamel or a cream. It was afterwards made with flake white or dry white lead ground in turps only and mixed with the polishing copal varnish with the addition of tints as required, by which means a white of any required character could be produced."

### Blue Japan Grounds.

Authorities state that these may be formed from bright Prussian blue or verditer glazed over with Prussian blue or of smalt. By bright Prussian blue possibly a genuine Prussian blue toned down to a sky blue with white lead is meant, and by verditer the variety known as refiners' blue verditer, and as to smalt it must not be forgotten that it changes its colour in artificial light. Be that as it may, the pigment may be mixed with the shellac varnish according to the instructions already given, but as the shellac will somewhat injure the tone of the pigment by imparting a yellow tinge to it where a bright true blue is required, the directions already given as regards white grounds must be carried out.

### Scarlet Japan Ground.

Vermilion is the best pigment to use for a scarlet japan ground, and its effect will be greatly enhanced by glazing it over with carmine or fine lake. If, however, the highest degree of brightness be required the white varnish must be used. Vermilion must be stoved at a very gentle heat.

### Red Japan Ground.

The basis of this japan ground is made up with madder lake ground in oil of turpentine, this constitutes the first ground; when this is perfectly dry a second coat of lake and white in copal varnish is applied, and the last coat is made up of lake in a mixture of copal varnish and turpentine varnish.

### Bright Pale Yellow Grounds.

Orpiment or King's yellow may be used, and the effect is enhanced by dissolving powdered turmeric root in the methylated spirits from which the upper or polishing coat is made, which methylated spirits must be strained from off the dregs before the seed-lac is added to it to form the varnish. The seed-lac varnish is not so injurious to yellow pigments as it is to the tone of some other pigments, because, being tinged a reddish yellow, it does little more than intensify or deepen the tone of the pigment.

### Green Japan Grounds.

Green japan grounds are produced by mixing Prussian blue or distilled verdigris with orpiment, and the effect is said to be extremely brilliant by applying them on a ground of leaf gold. Any of them may be used with good seed-lac varnish, for reasons already given. Equal parts by weight of rosin, precipitated rosinate of copper, and coal-tar solvent naphtha will give a varnish which, when suitably thinned and the coats stoved at a heat below 212° F., will give a green japan second to none as a finishing coat as regards purity of tone at least. To harden it and render it more elastic half of the rosin might be replaced by equal weights of a copal soluble in solvent naphtha and boiled linseed oil, so that the mixture would stand thus: rosinate of copper 1 lb., rosin $^1/_2$ lb., boiled oil $^1/_4$ lb., hard resin (copal) $^1/_4$ lb., solvent naphtha 1 lb. When heated to a high temperature this rosinate of copper varnish yields a magnificent ruby bronze coloration, especially on glass. Verdigris dissolves in turpentine, and successful attempts might be made to make a green japan varnish from it on the lines indicated for rosinate of copper.

### Orange-coloured Grounds.

Orange-coloured grounds may be formed by mixing vermilion or red lead with King's yellow, or orange lake or red orpiment (? realgar) will make a brighter orange ground than can be produced by any mixture.

### Purple Grounds.

Purple grounds may be produced by the admixture of lake or vermilion with Prussian blue. They may be treated as the other coloured grounds as regards the varnish vehicle.

## Black Grounds.

Black grounds may be formed either from lamp black or ivory black, but ivory black is preferable to lamp black, and possibly carbon black or gas black to either. These may be always applied with the shellac varnish as a vehicle, and their upper or polishing coats may consist of common seed-lac varnish. But the best quality of ivory black ground in the best super black japan yields, after suitable stoving, a very excellent black indeed, the purity of tone of which may be improved by adding a little blue in the grinding.

## Common Black Japan Grounds On Metal.

Common black japan grounds on metal by means of heat are procured in the following manner: The surface to be japanned must be coated over with drying oil, and when it is moderately dry must be put into a stove of such heat as will change the oil black without burning it. The stove should not be too hot when the oil is put into it nor the heat increased too fast, either which error would make it blister, but the slower the heat is increased and the longer it is continued, provided it be restrained within a due degree, the harder will be the coat of japan. This kind of japan requires no polish, having received from the heat, when properly regulated, a sufficiently bright surface.

## Tortoise-Shell Ground.

This beautiful ground, produced by heat, is valued not only for its hardness and its capacity to stand a heat greater than that of boiling water, but also for its fine appearance. It is made by means of a varnish prepared thus: Take one gallon of good linseed oil and half a pound of umber, boil them together until the oil becomes very brown and thick, strain it then through a coarse cloth and set it again to boil, in which state it must be continued until it acquires a consistency resembling that of pitch; it will then be fit for use. Hav-

ing thus prepared the varnish, clean well the surface which is to be japanned; then apply vermilion ground in shellac varnish or with drying oil, very thinly diluted with oil of turpentine, on the places intended to imitate the more transparent parts of the tortoise-shell. When the vermilion is dry, brush the whole over with the black varnish thinned to the right consistency with oil of turpentine. When set and firm put the work into a stove where it may undergo a very strong heat, which must be continued a considerable time, for three weeks or even a month so much the better. This ground may be decorated with painting and gilding in the same way as any other varnished surface, which had best be done after the ground has been hardened, but it is well to give a second annealing at a very gentle heat after it has been finished. A very good black japan may be made by mixing a little japan gold size with ivory or lamp-black, this will develop a good gloss without requiring to be varnished afterwards.

## Painting Japan Work.

Japan work should be painted with real "enamel paints," that is with paints actually ground in varnish, and in that case all pigments may be used and the peculiar disadvantages, which attend several pigments with respect to oil or water, cease with this class of vehicle, for they are secured by it when properly handled from the least danger of changing or fading. The preparation of pigments for this purpose consists in bringing them to a due state of fineness by grinding them on a stone with turpentine. The best varnish for binding and preserving the pigments is shellac. This, when judiciously handled, gives such a firmness and hardness to the work that, if it be afterwards further secured with a moderately thick coat of seed-lac varnish, it will be almost as hard and durable as glass. The method of painting in varnish is, however, far more tedious than with an oil or water vehicle. It is, therefore, now very usual in japan work for the sake of dispatch, and in some cases in order to be able to use the pencil (brush) more freely, to apply the colours in an oil vehicle well diluted with turps. This oil (or japanners' gold size) may be made thus: Take 1 lb. of linseed oil and 4 oz. of gum anime, set the oil in a proper vessel and then add the gum anime powder, stirring it well until the whole is mixed with the oil. Let the mixture

continue to boil until it appears of a thick consistence, then strain the whole through a coarse cloth and keep it for use. The pigments are also sometimes applied in a gum-water vehicle, but work so done, it has been urged, is not nearly so durable as that done in varnish or oil. However, those who formerly condemned the practice of japanning water-coloured decorations allowed that amateurs, who practised japanning for their amusement only and thus might not find it convenient to stock the necessary preparations for the other methods, might paint with water-colours. If the pigments are ground in an aqueous vehicle of strong isinglass size and honey instead of gum water the work would not be much inferior to that executed with other vehicles. Water-colours are sometimes applied on a ground of gold after the style of other paintings, and sometimes so as to produce an embossed effect. The pigments in this style of painting are ground in a vehicle of isinglass size corrected with honey or sugar-candy. The body with which the embossed work is raised is best formed of strong gum water thickened to a proper consistency with armenian bole and whiting in equal parts, which, being laid on in the proper figures and repaired when dry, may be then painted with the intended pigments in the vehicle of isinglass size or in the general manner with shellac varnish. As to the comparative value of pigments ground in water and ground in oil, that is between oil-colours and water-colours in enamelling and japanning, there seems to have been a change of opinion for some time back, especially as regards the enamelling of slate. The marbling of slate (to be enamelled) in water-colours is a process which Mr. Dickson says well repays study. It is greatly developed in France and Germany. The process is a quick one and the pigments are said to stand well and to maintain their pristine hue, yet if many strikingly natural effects result from the use of this process, its use has not spread in Great Britain, being confined wholly and solely to the marbling of slate (except in the case of wall-paper which is water-marbled in a somewhat similar way).

"In painting in oil-colour," says Mr. Dickson, "the craftsman trusts largely to his badger-hair brush to produce his effects of softness and marbly appearance; but in painting in water-colours, this softness, depth, and marbly appearance are produced mostly by the colour placed upon the surface, and left entirely untouched by

badger or any other brush. The colour drying quickly, does not allow much time for working, and when dry it cannot be touched without spoiling the whole of the work. The difference first of all between painting in water and in oil colour, is that a peculiar grain exists with painting in water that it is absolutely impossible to get in oil. The charm of a marble is, I think, its translucency as much as its beautiful colour; it is to that translucency (for in marble fixed we have no transparency) that it owes its softness of effect, which makes marble of such decorative value. This translucency can only be obtained by thin glazes of colour, by which means each succeeding glaze only partly covers the previous one, the character of the marble being thus produced. This is done sometimes in oil-colour in a marvellous manner, but even the best of oil-painting in marble cannot stand the comparison of water-colour, and it is only by comparison that any accurate judgment can be formed of any work. The production of marbles in water-colour has a depth, softness, and stoniness that defies oil-painting, and in some cases will defy detection unless by an expert of marbles. It may be that first of all the materials employed are more in keeping with the real material, as no oil enters into the composition of real marble, and by using the medium of water we thus start better, but the real secret is that by using water as a medium the colours take an entirely different effect. In painting in water-colour greys of any tint or strength can be obtained suitable for the production of a marble of greyish ground, by pure white, tinted as required, being applied of different thicknesses of colour, all the modulations of tone being obtained by the difference in the thickness of the colour applied."

## Varnishing Japan Work.

Varnishing is the last and the finishing process in japanning. It consists in (1) applying, and (2) polishing the outer coats of varnish, which are equally necessary whether the plain japan ground be painted on or not. This is best done in a general way with common seed-lac varnish, except on those occasions where other methods have been shown to be more expedient, and the same reasons, which decide as to the propriety of using the different varnishes as regards the colours of the ground, hold equally with those of the painting, for where brightness is a material point and a tinge of

yellow would injure it, seed-lac must give way to the whiter resins; but where hardness and tenacity are essential it must be adhered to, and where both are necessary a mixed varnish must be used. This mixed varnish should be made from the picked seed-lac as directed in the case of the white japan grounds. The common seed-lac varnish may be made thus: Take 1½ lb. of seed-lac and wash it well in several waters, then dry it and powder it coarsely and put it with a gallon of methylated spirits into a Bohemian glass flask so that it be not more than two-thirds full. Shake the mixture well together and place the flask in a gentle heat till the seed-lac appears to be dissolved, the shaking being in the meantime repeated as often as may be convenient; then pour off all the clear and strain the remainder through a coarse cloth. The varnish so prepared must be kept for use in a well-corked glass vessel. The whiter seed-lac varnishes are used in the same manner as the common, except as regards the substances used in polishing, which, where a pure white or the greater clearness or purity of other pigments is in question, should be itself white, while the browner sorts of polishing dust, as being cheaper and doing their business with greater dispatch, may be used in other cases. The pieces of work to be varnished should be placed near the fire or in a warm room and made perfectly dry, and then the varnish may be applied with a flat camel-hair brush made for the purpose. This must be done very rapidly, but with great care; the same place should not be passed twice over in laying on one coat if it can possibly be avoided. The best way of proceeding is to begin in the middle and pass the brush to one end, then with another stroke from the middle pass it to the other end, taking care that before each stroke the brush be well supplied with varnish; when one coat is dry another must be laid over it in like manner, and this must be continued five or six times. If on trial there be not a sufficient thickness of varnish to bear the polish without laying bare the painting or ground colour underneath more varnish must be applied. When a sufficient number of coats of varnish is so applied the work is fit to be polished, which must be done in common work by rubbing it with a piece of cloth or felt dipped in tripoli or finely ground pumice-stone. But towards the end of the rubbing a little oil of any kind must be used with the powder, and when the work appears sufficiently bright and glossy it should be well rubbed with the oil alone to clean it from the powder and to give it a still greater